

Evolution of human behavior

What are the similarities/
differences between human and
animal behaviors?



Can evolutionary theory of natural selection help us to better understand human behavior?

Natural selection:

Our behavioral attributes should help us pass on our genes to the next generation

- Increase fitness

- adaptive

Is human culture
shaped by natural selection?

Does human culture have
innate (genetic predisposed)
basis?

Culture influences our behavior
but how does it come to be?



Arbitrary culture theory (anthropologist's views)

Our culture reflects arbitrary process by which traditions originate and persist over time.

--Nothing to do with fitness (Natural selection)

If we hypothesize human culture is evolved through natural selection, we need to (1) find evolutionary roots in the animal kingdom.

Animals do have “culture”:
learned behaviors can be copied and
transmitted to next generations,
Is it adaptive?



If we hypothesize human culture is evolved through natural selection, we need to (2) prove the culture is “adaptive”.

Culture influences our behavior
is it adaptive to our environment?



Can human culture
explained by
natural selection?

-behavior is adaptive to
our living environment

Evolution (natural selection) theory provides **testable hypothesis** for us to better understand our behaviors and cultures

Test hypotheses from:

Anthropologist's perspective

Psychologist's perspective

Evolutionary biologist's perspective

Human behavior/ culture shaped by natural selection

Example #1: Blood donation

Example #2: Adoption

Example #3: Mate choice

Example #4: Religion (belief in supernatural)

Final exam question:

1. Is **Blood-donation** evolutionary adaptive?



Blood-donation



Evolutionary adaptive?

- reciprocity: benefit donors and recipients
- Altruistic behavior? Benefit recipients (strangers) cost donors (assume group selection works)

Cultural influence?

- benefit may not require

Evolution hypothesis of blood donation:

Blood donor is repaid by the donor's everyday's companions- Reciprocity



Final exam question:

2. Adoption

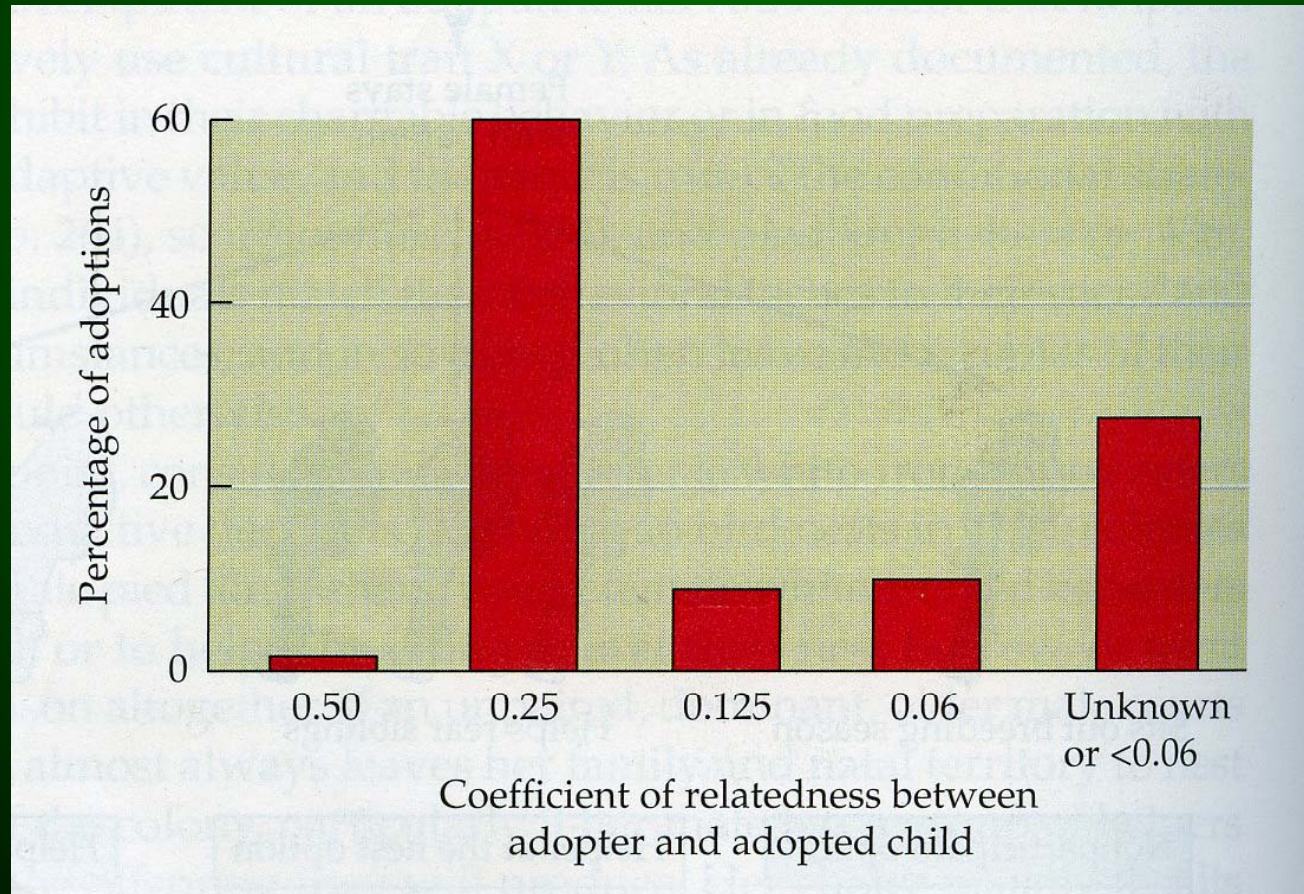


Is adoption simply a culture phenomenon,
or it has its evolutionary roots?

Evolutionary adaptation for adoption is supported by

1. Inclusive fitness: kin-selection
2. Direct benefit: helper
3. Mal-adaptive proximate mechanism

In Oceania islands, most adopters cared for children who were cousin or closer ($r=0.125$)



Mal-adaptive :

Inhibit a person's ability to adjust to particular situations. It is often used to reduce one's anxiety, but the result is non-adaptive

proximate mechanisms for love and care of unrelated children:

→ mal-adaptive in physiological/
psychological mechanisms

Mal-adaptive hypothesis

Predictions:

Couples lost the only child,
or fail to produce children,
prone to adopt stranger

Mal-adaptive hypothesis

animal examples?



Mal-adaptive hypothesis

animal examples?



Human behavior/ culture shaped by natural selection

Example #1: Blood donation

Example #2: Adoption

Example #3: Mate choice

Example #4: Parental care

Example #5: Religion (belief in supernatural)

Evolutionary theory for adoption is supported by

1. Inclusive fitness: kin selection
2. Direct benefit; or reciprocity
3. Mal-adaptive proximate mechanism

3. Mate choice



Mate choice in humans:
Culture influence?
Or shaped by Natural selection?

Evolutionary models of mate choice

-enhance offspring fitness

- 1. Good gene hypothesis
 - traits that signal good gene,
 - Symmetry, MHC, Healthy, Fertility
- 2. Direct benefit hypothesis
 - Wealthy, abundant resources...
- 3. Runaway hypothesis
- 4. Sensory exploitation hypothesis

Adaptive mate choice assumes:

A woman's reproductive success is advanced by access to a partner's material assistance and parental care

Women may find wealthy, paternal men more attractive.

Fit in which animal “mate choice” models?

Adaptive mate choice assumes:

A man's reproductive success is advanced by access to a partner's fertility, health and good parental care

Men may find healthy, fertile young women more attractive.

Human mate choice,
Innate preference?
Or culture influence?

Evidence of **innate** mate preference:

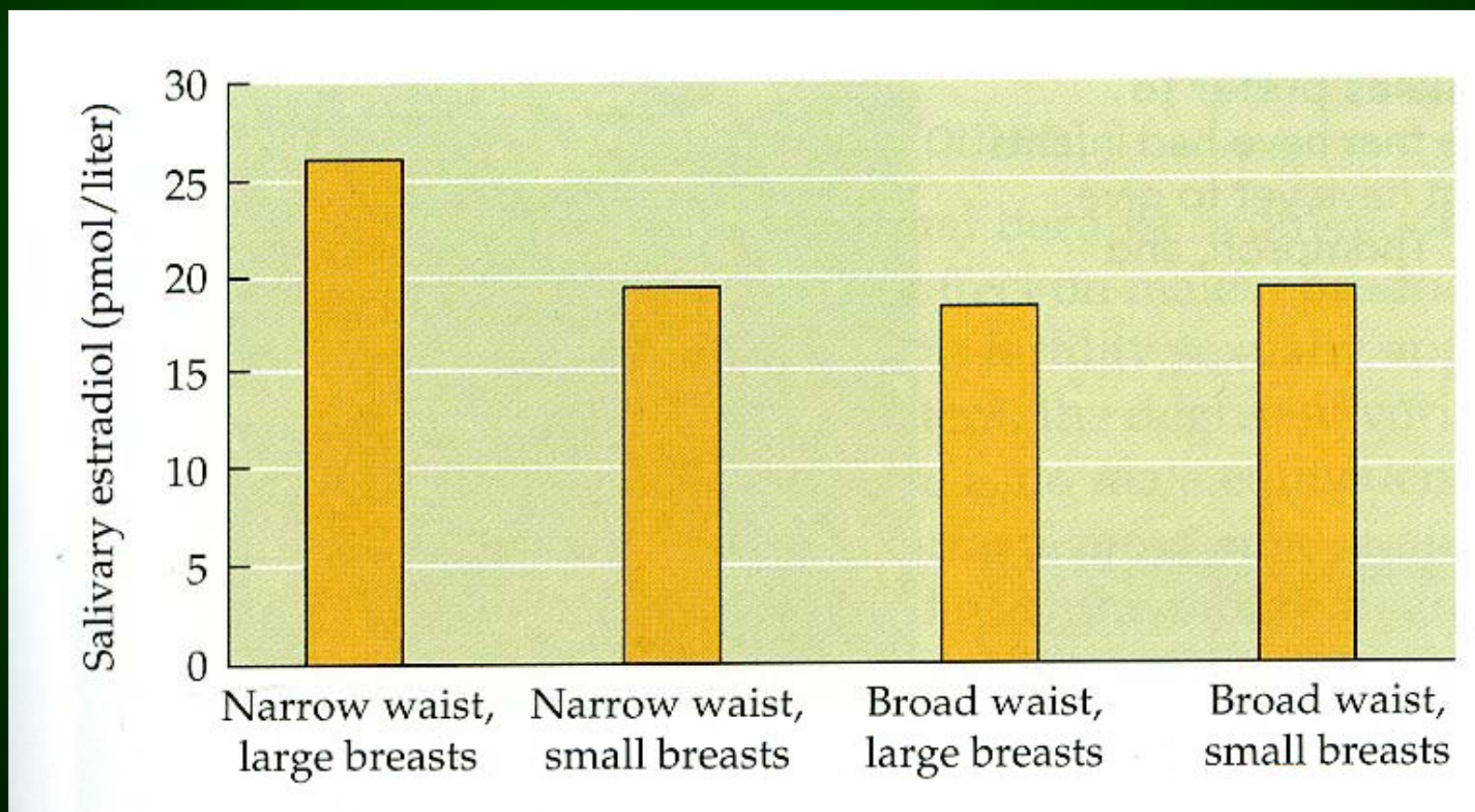
2. Good gene hypothesis and
Fertility, Health, Body

Men across cultures and countries have a universal preference for women with a low waist-to-hip ratio (~ 0.7)
– fertility, healthy (hormone), young adult

Innate preference?

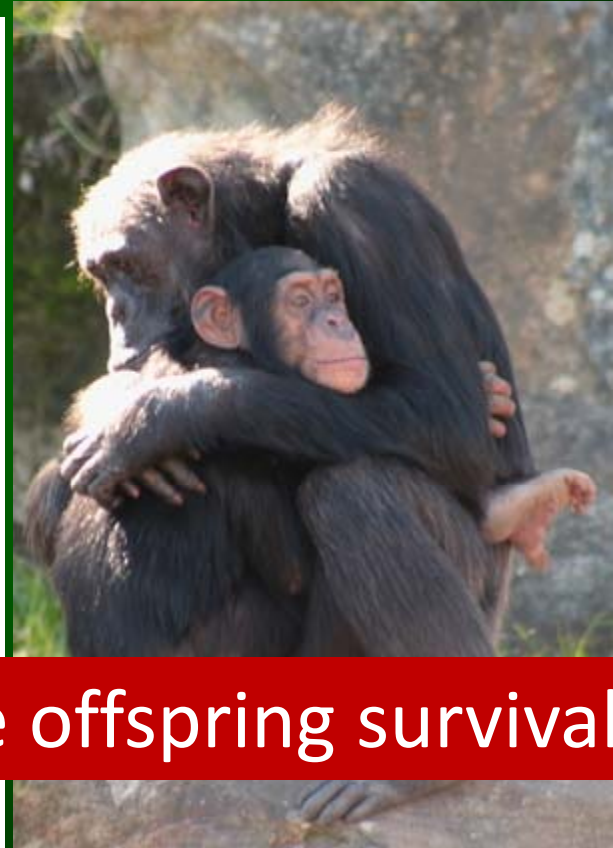
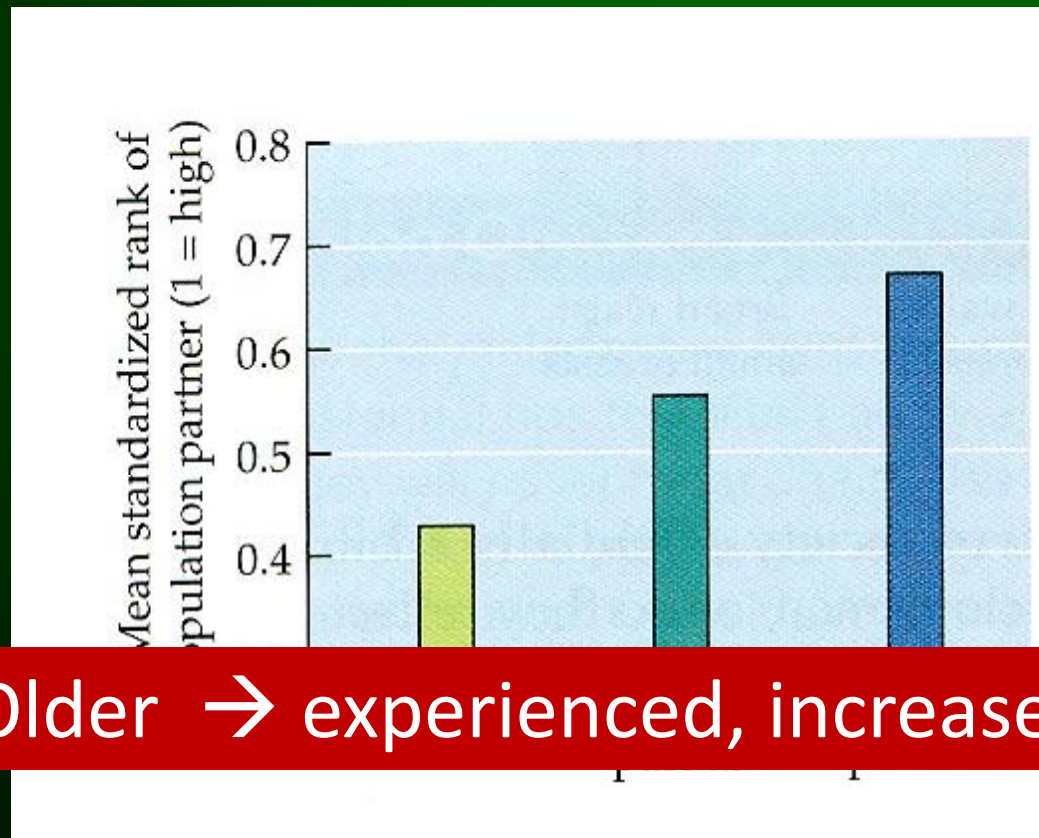


Body shape is correlated with fertility in women



In **humans**, males prefer choosing younger females,

In **chimps**, males prefer choosing older females, why??



Older → experienced, increase offspring survival

Men across cultures and countries tend to have a preference for women with blonde hairs.

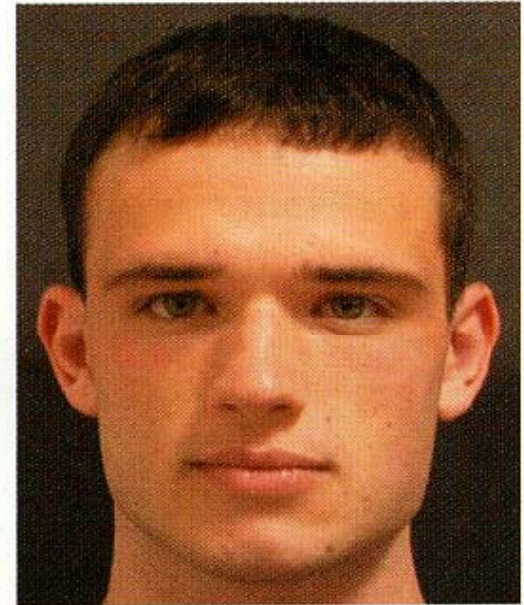
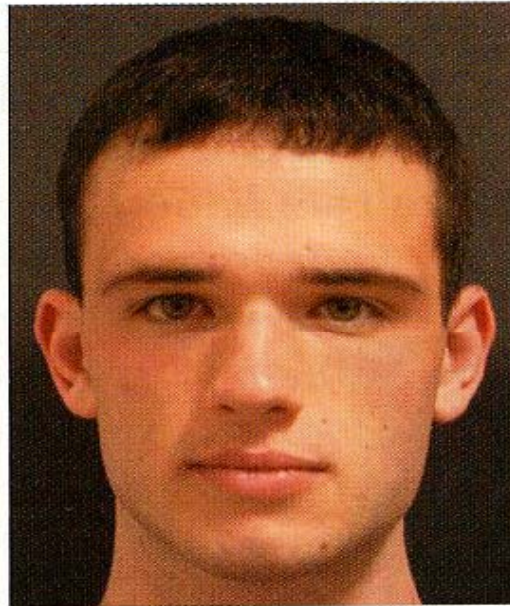
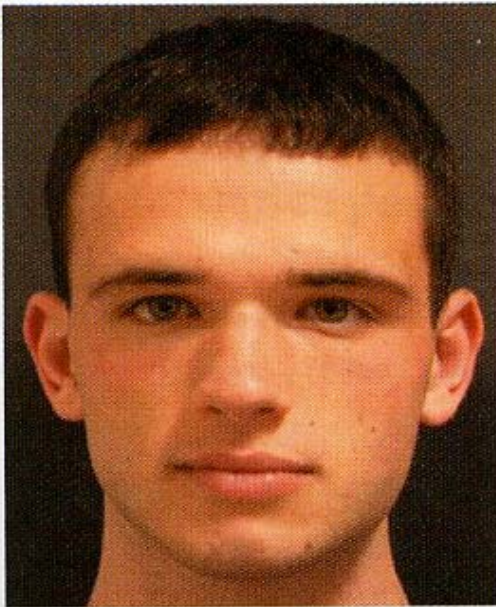
Evolutionary hypotheses

1. Estrogen?
2. Youth?
3. Fertility?
4. Health?
5. Sensory exploitation?

No clear answer yet

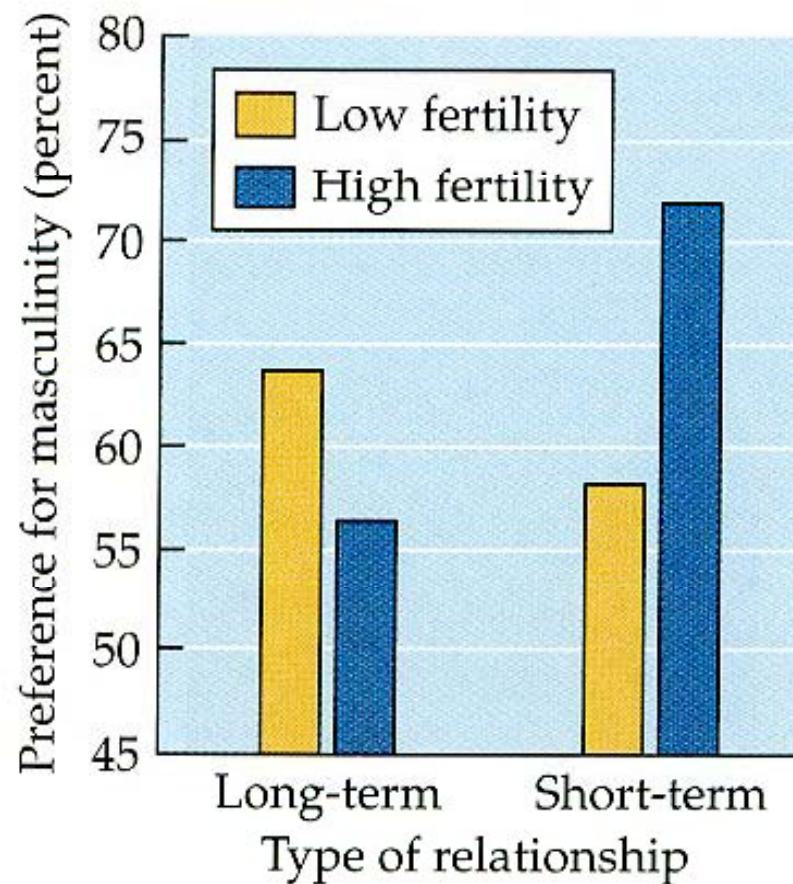


(A)



Females choose males:
Which photo is more dominant?
Which one is more attractive?
Which one has higher testosterone?
Which one has “better” gene?
What would females choose?

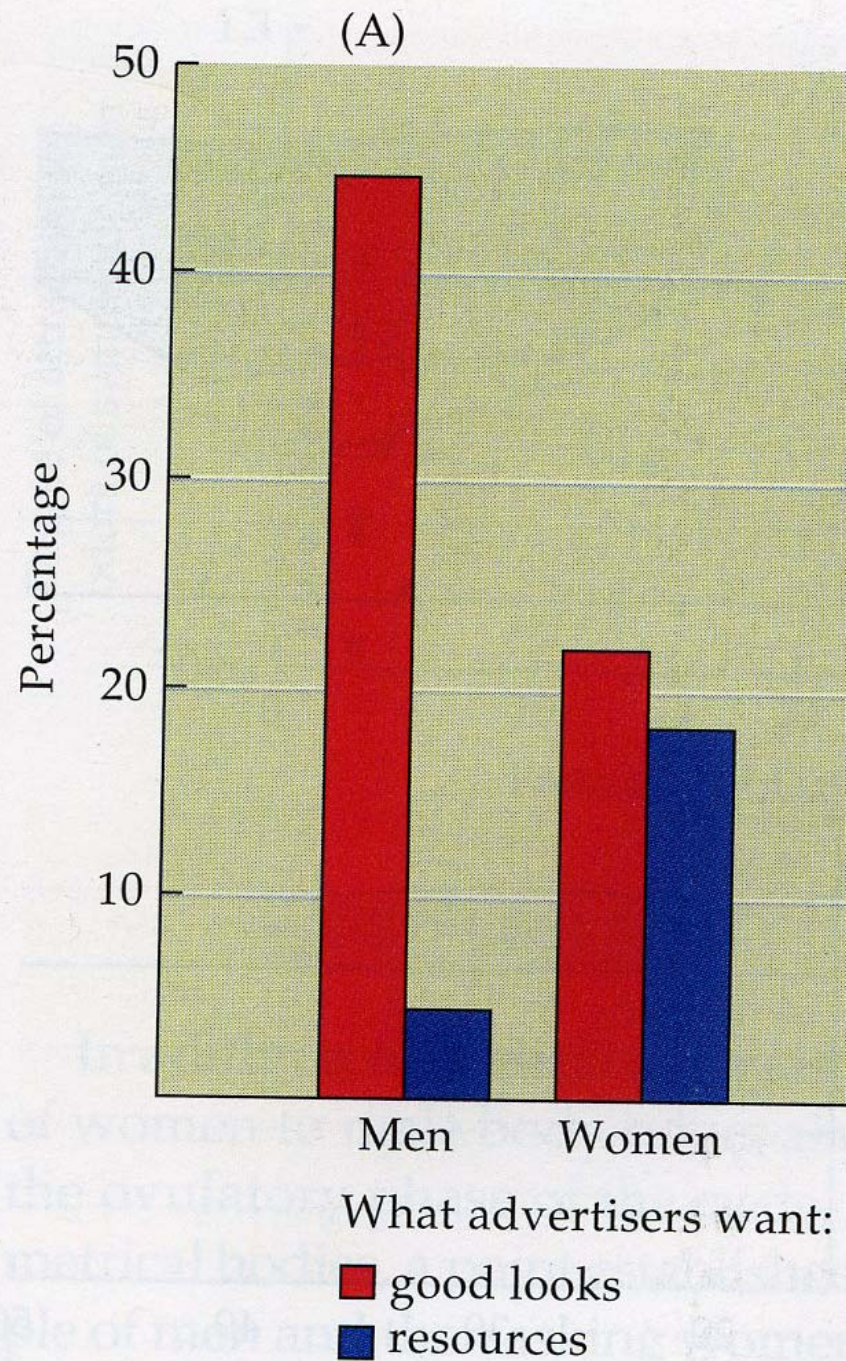
What females choose might depend on situations:
Ovulating females prefer “big muscle” in short term relationship
prefer “good dad” in long term relationship



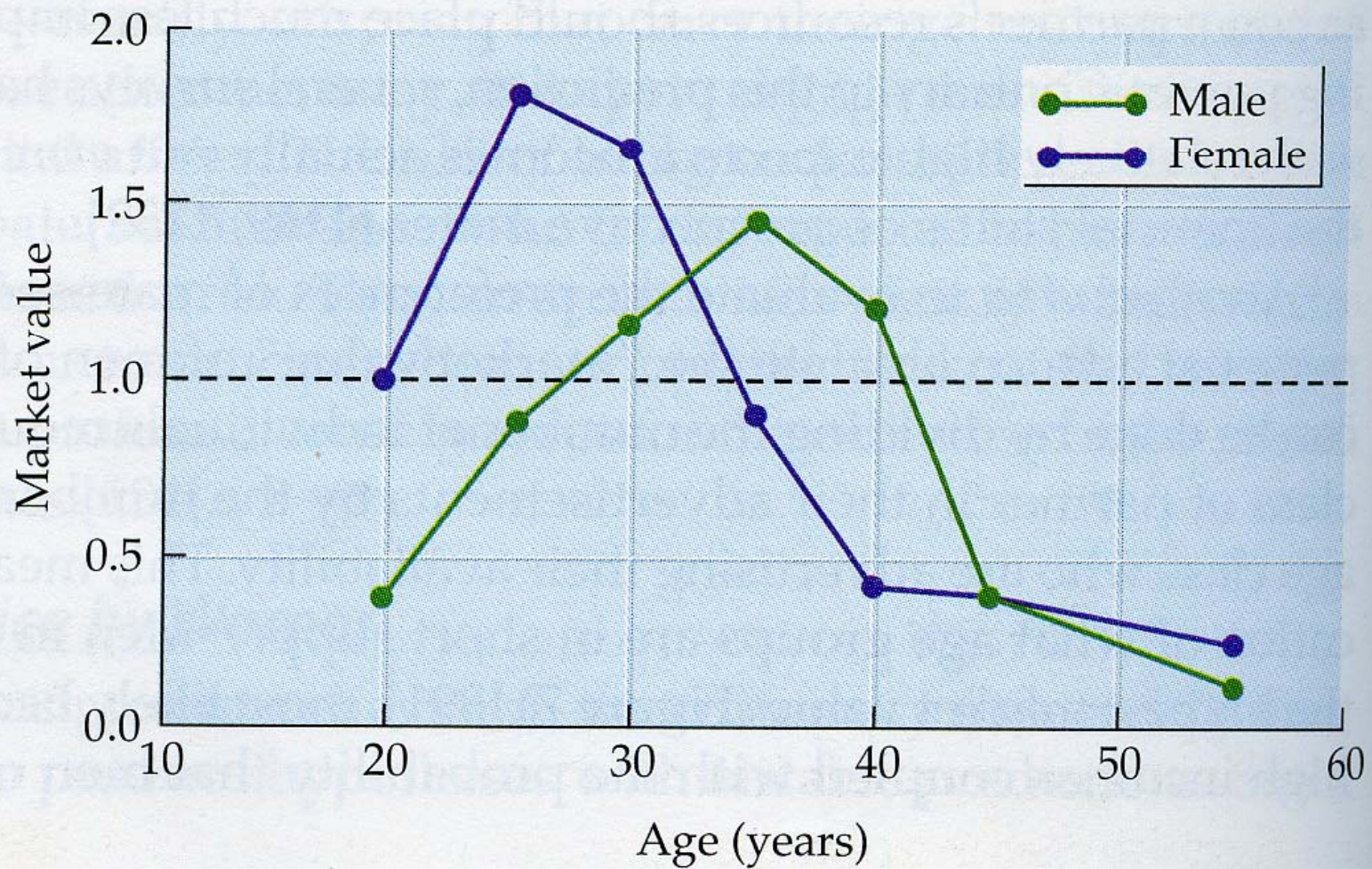
Adaptive mate choice

A woman's reproductive success is advanced by access to a partner's material assistance and parental care

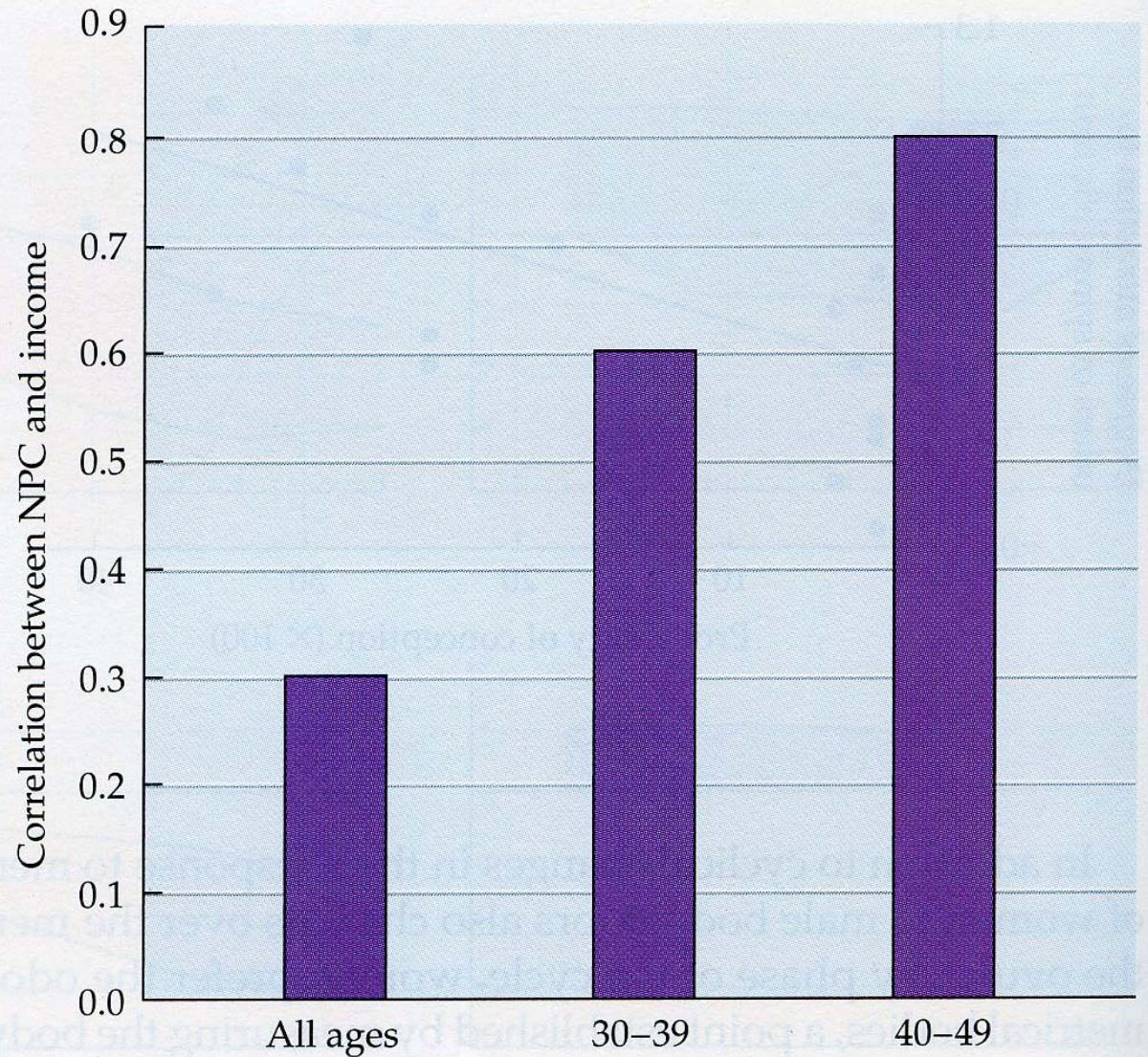
Women should find wealthy, paternal men more attractive.



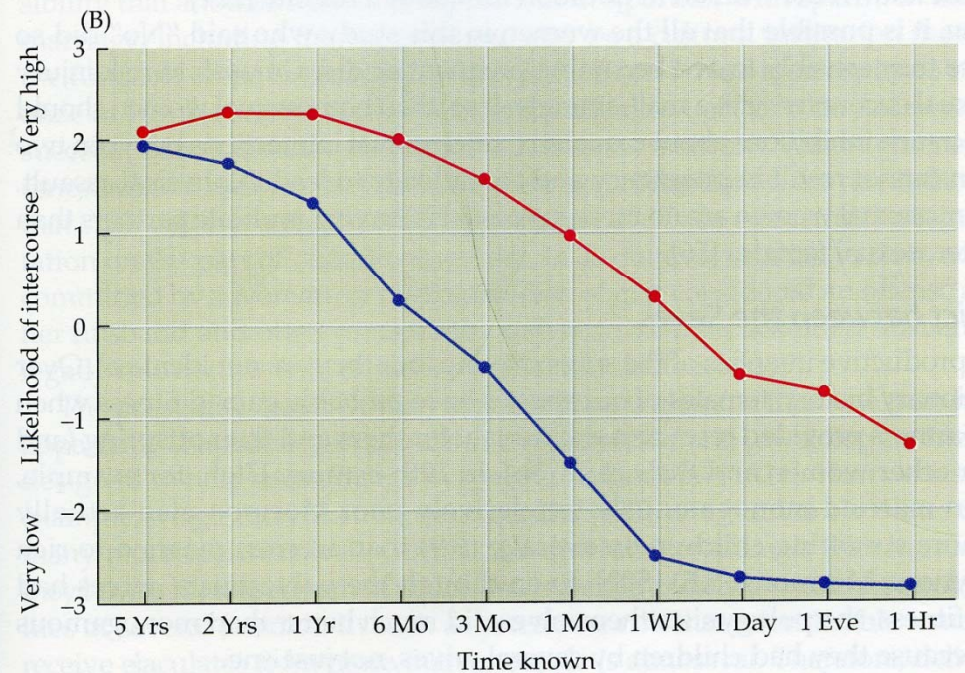
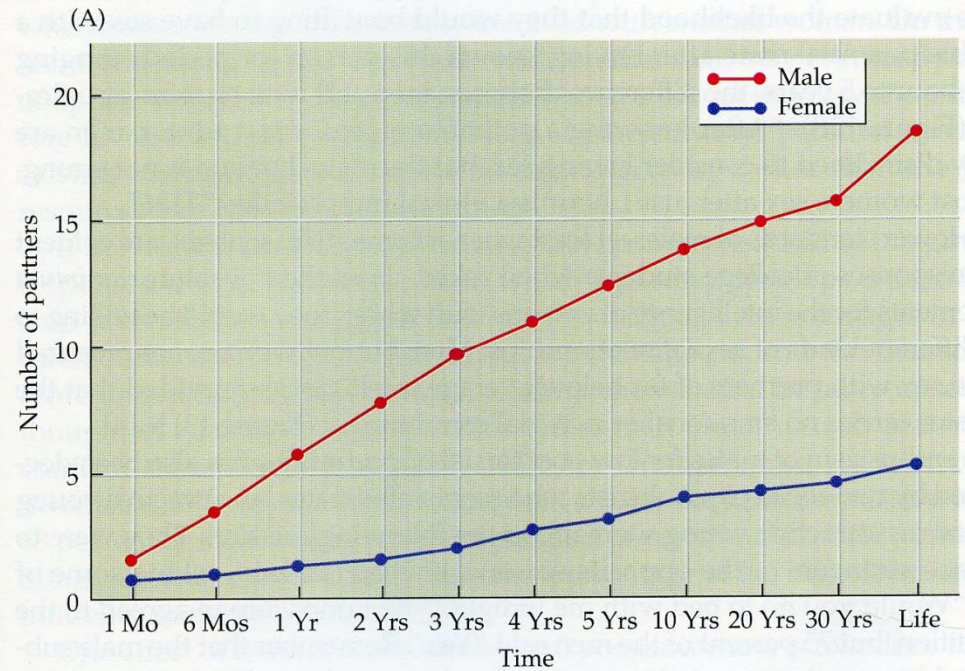
Market value vs. age



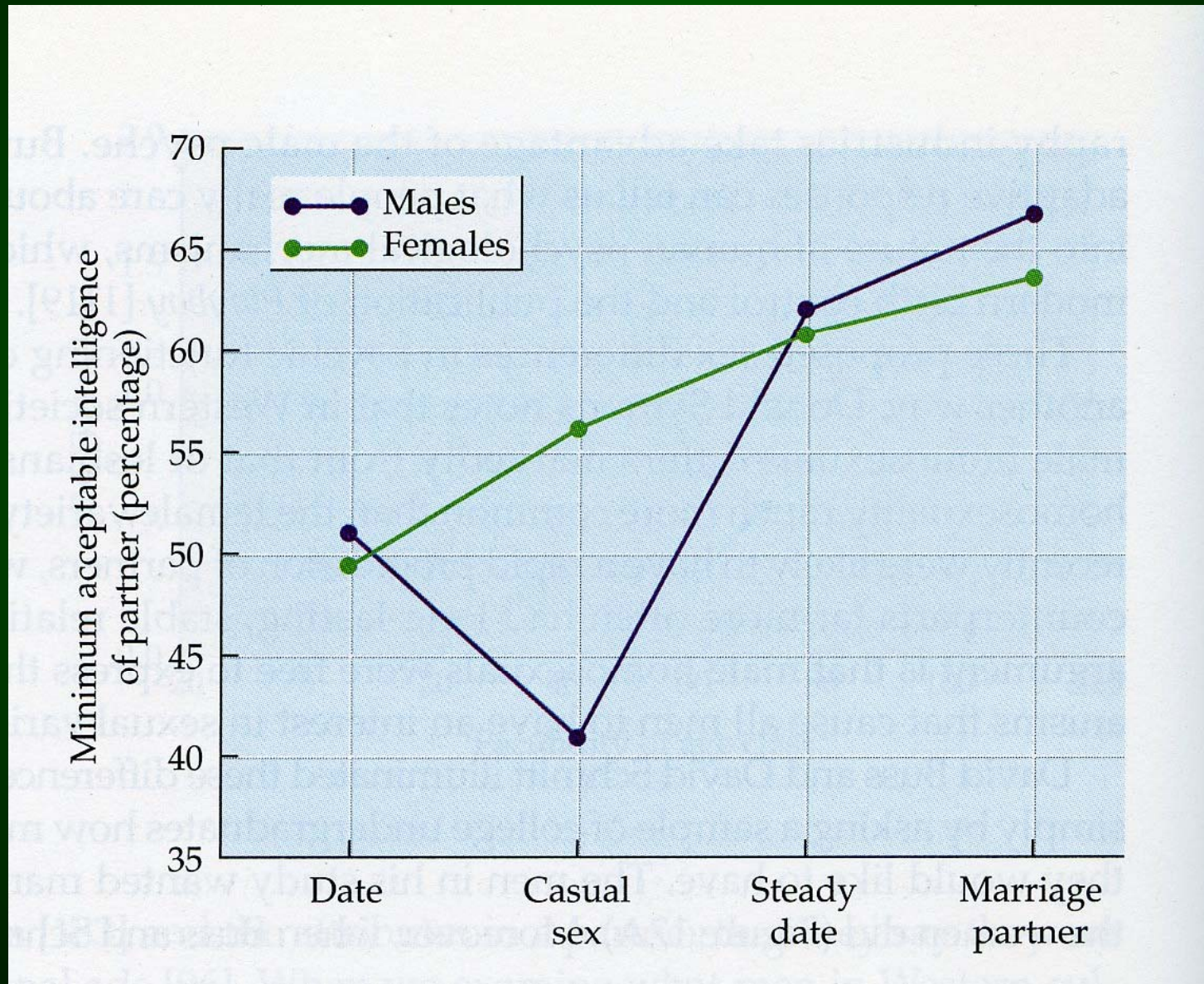
Male mating success is highly correlated with male income



Sex difference in the desire for sexual variety



Casual sex and the partner's intelligence

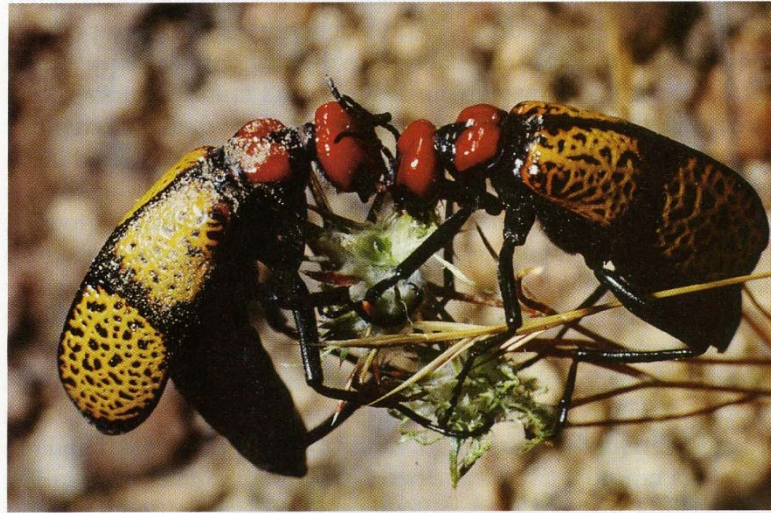


Sexual conflict: Rape

Alternative reproductive strategy?
(sexual selection hypothesis)

Or violent attack?

Rape is alternative reproductive strategy in low-ranking animals



If rape were motivated purely by the
intent of attack women violently:

we predict

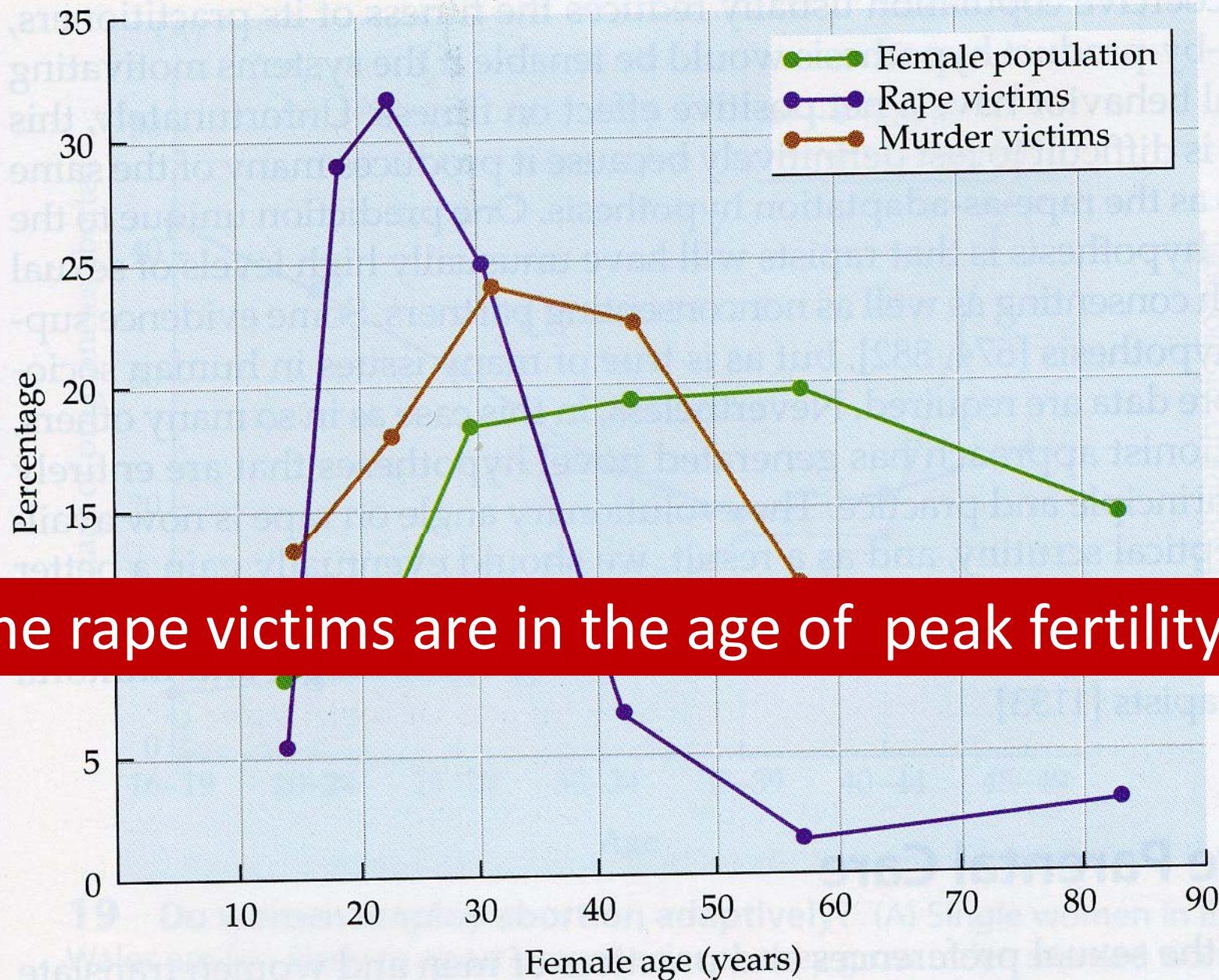
the distribution of rape victims would
match that of female murder victim.

If rape were an alternative reproductive
strategy for men:

we predict

1. rape will lead to women pregnancy
2. the distribution of rape victims would
match that of fertile females.

Rape is not just violent attack



Step-parental care

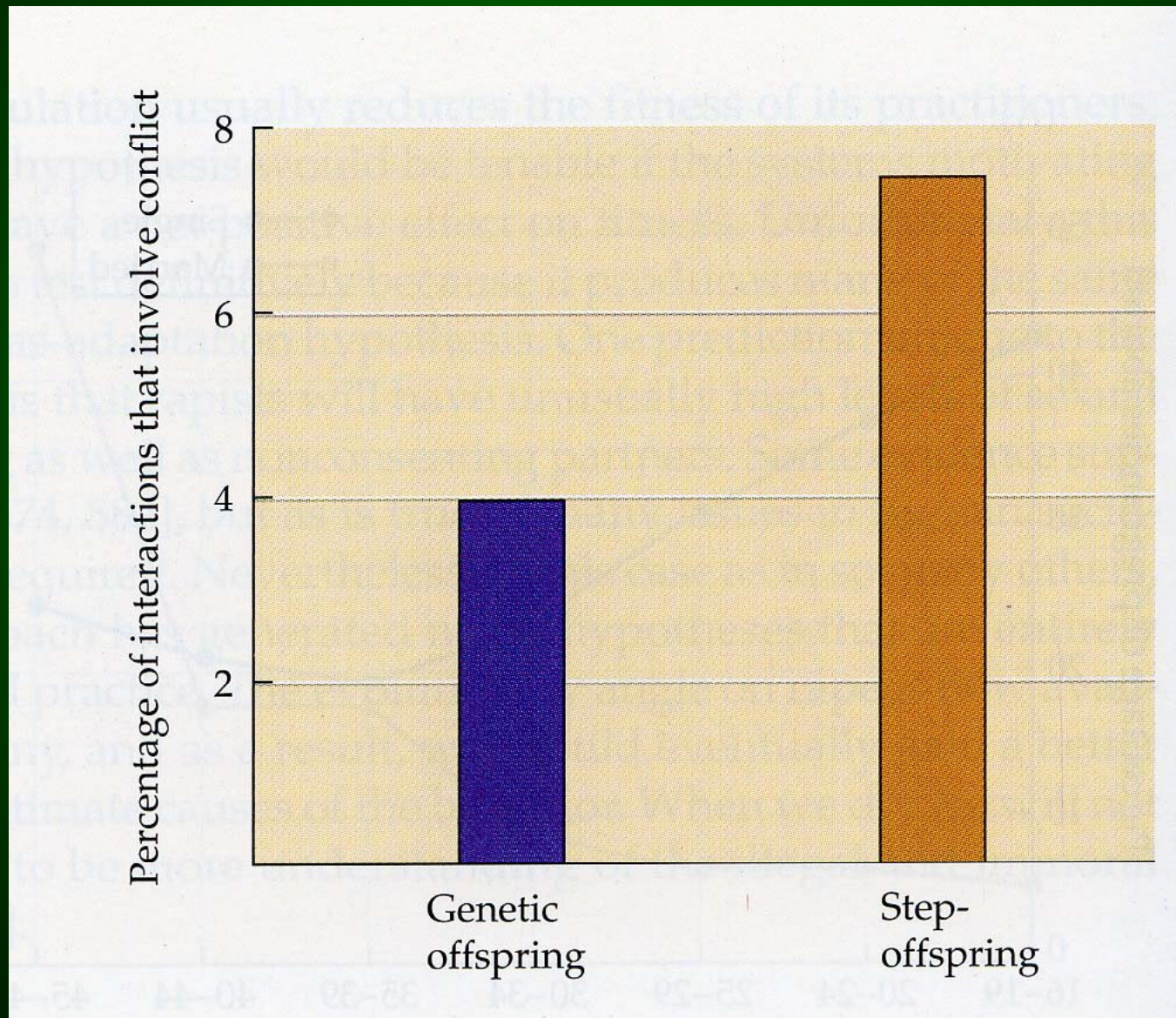
Step-parental care

Evolutionary theory predicts:
Stepfather should favor their
genetic offspring (carry their genes)
over stepchildren

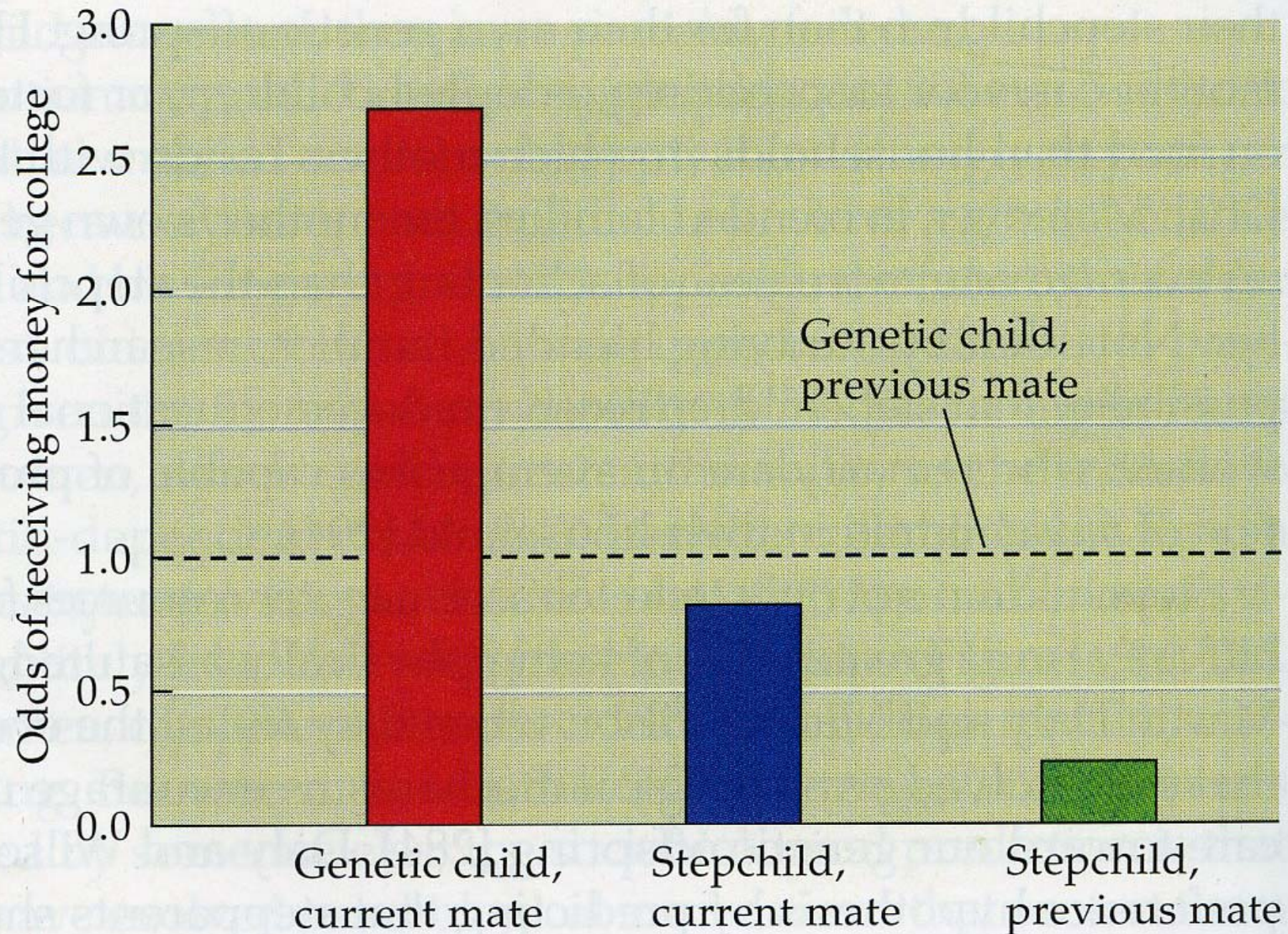
In animals:

Males care about paternity to
ensure their own genetic offspring

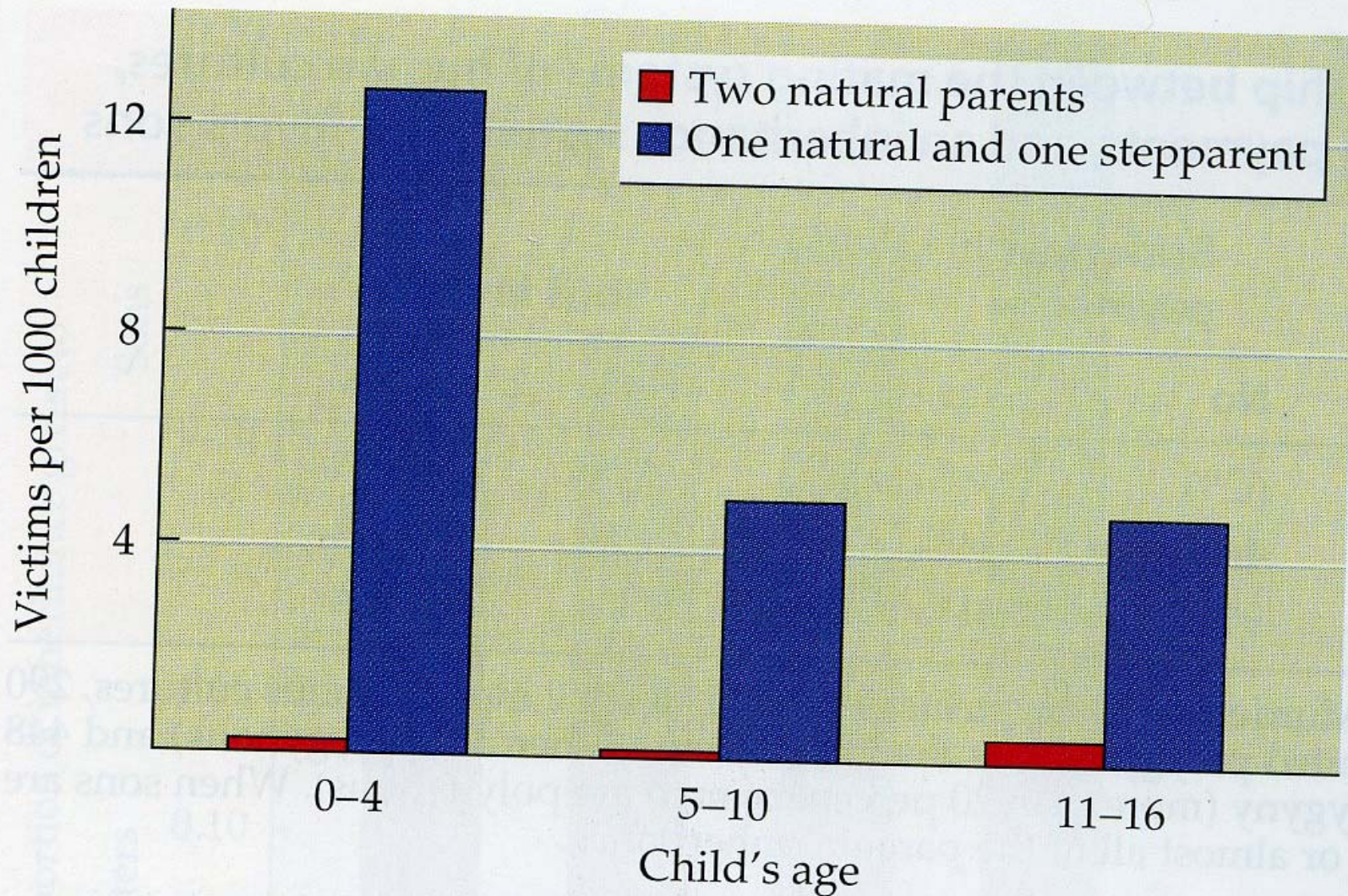
More conflicts between men and their stepchildren



Men provide less financial aid: stepchildren



Step-parenting and child abuse



Parents benefit from
children marriage

The culture of
Bridewealth and dowry

Bridewealth and dowry



Bridewealth and dowry

Arbitrary cultural traditions (anthropological perspective)
bridewealth and dowry should be equally represented
among cultures worldwide.

Evolutionary theory of sexual selection predicts
Males tend to compete for females
Females tend to choose males
bridewealth should be more common than dowry

66 % of 1267 societies : bridewealth payment
3% of 1267 societies: dowry payment

Bridewealth and dowry

Arbitrary cultural traditions (anthropological perspective)
bridewealth should be equally represented
between monogamous and polygynous cultures.

Evolutionary theory of sexual selection predicts
Males tend to compete for females
Females tend to choose males
bridewealth should be more common in polygyny culture

As predicted by sexual selection,
Polygyny cultures provide more bridewealth payment

Mating system	Bridewealth payment	Sons favored
Monogamy N=112 cultures	38%	58%
Limited polygyny (<20% of men: polygyny) N=290 cultures	54%	80%
General polygyny (>20% of men polygyny) N=448 cultures	91%	97%

Religion (supernatural):
universal human culture

Religion:

Is it evolutionary adaptive?
Or is it acquired by culture?

Humans are born with a tendency to
form supernatural beliefs ?
or acquire this ability through
cultural exposure?



Figure 3. In a study designed to determine whether human beings are born with a tendency to form supernatural beliefs or acquire this ability through cultural exposure, children of various ages were told a story in a puppet show wherein a young mouse is suddenly eaten by an alligator. The children were then asked to describe the mouse's ability to feel or know things after its death (see Figure 4 for results).

Young children with least cultural influence

Was its brain still working?

Was it still hungry?

Was it still angry at its brother?

Was it still miss / love its mom?

Prediction: If belief in an after life is entirely cultural, older children would have had more culture exposure.

The younger the child, the more likely he (she) was to endow the dead mouse with the capacity to experience various mental states: belief in afterlife.

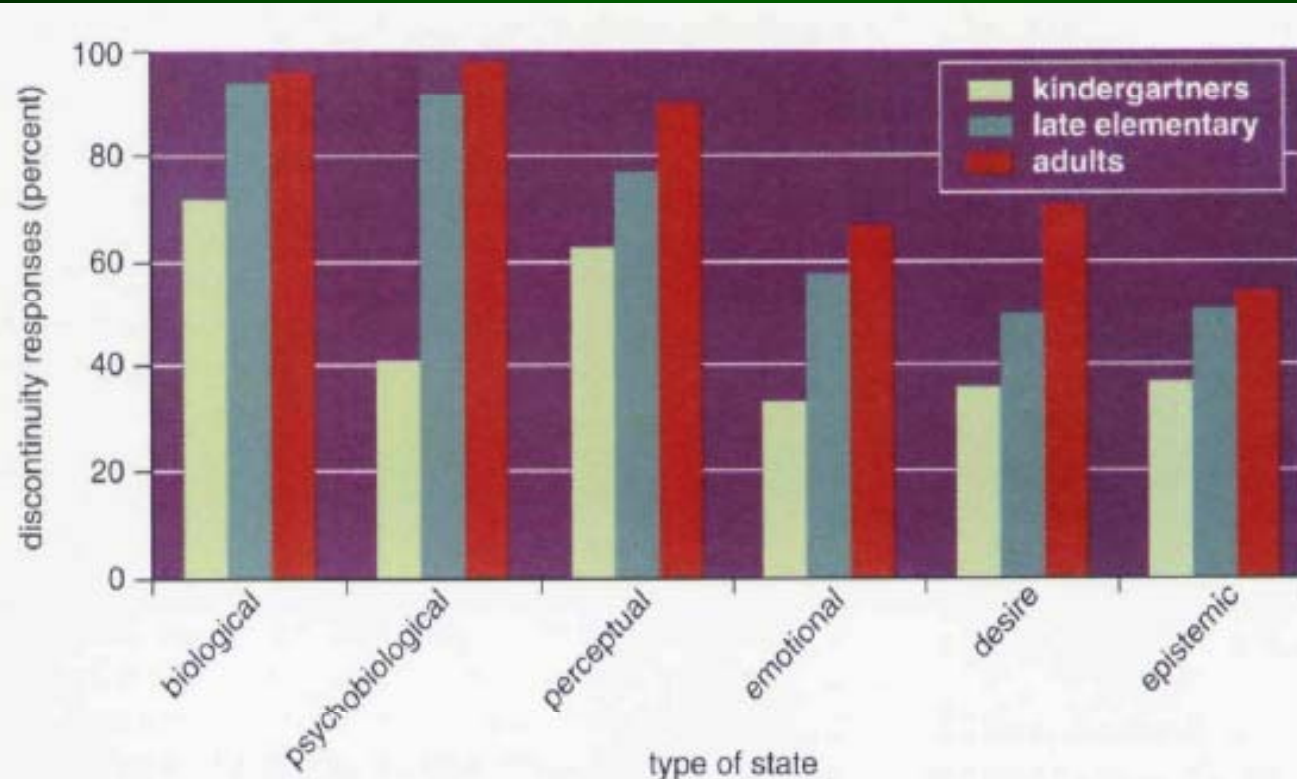


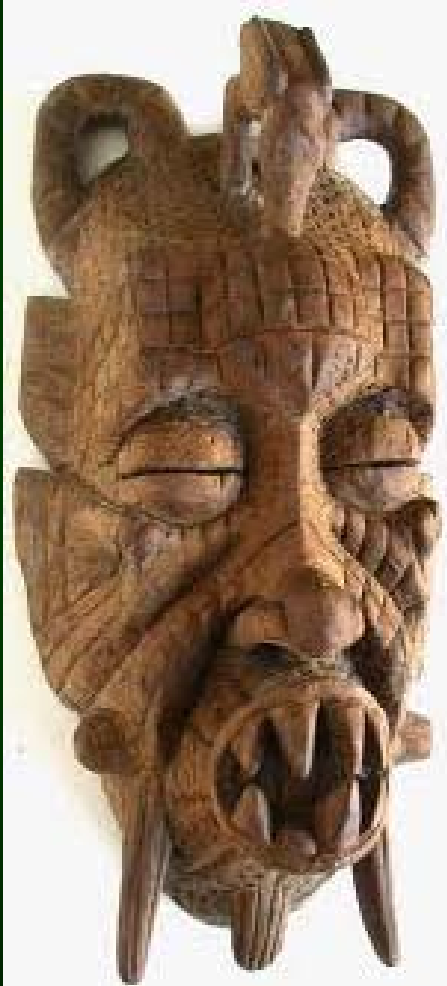
Figure 4. In the experiment described in Figure 3, children of different ages were asked about biological and mental states after death. Adults were asked to answer the same questions for the purpose of comparison. Questions were in biological (need to eat, brain function), psychobiological (hunger, thirst), perceptual (hearing, tasting), emotional (love, anger), desire (wish, want) and epistemic (believe, know) categories. Data indicate the prevalence of discontinuity responses, where respondents denied the dead mouse's ability to experience these states. Younger children were more likely to attribute all abilities to the dead mouse than were older children and adults, the opposite of what would be expected if supernatural beliefs were from cultural indoctrination.

Adaptive value of having instincts of supernatural belief

Religion is a good way to persuading the person to refrain from social deviance .

- Prevent selfish behavior: cheating, stealing...

Adaptive value of having supernatural belief



“ behave yourself...
your ancestor’s ghost is
watching over you...”

Human behavior/ culture shaped by natural selection and has evolutionary basis

Example #1: Blood donation

Example #2: Adoption

Example #3: Mate choice

Example #4: Step-parental care

Example #4: Religion (belief in supernatural)